Agriculture Education and Market Improvement Program (AEMIP)

Gendered Farming Practices in Guinea Survey Report

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AEMIP
Winrock International
ISAV/F Campus
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Contact AEMIP
Andrew Kovarik,
Program Director
ISAV/F Campus
Faranah, Guinea
+224-62-082-0 433
akovarik@winrock.org

Cecile Ndiaye Claire, ISAV/F Masters Student managing her research plot concerning the integration of rice and cowpea. Photo by Steve Luna

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Acronym List

AEMIP	Agriculture Education and Market Improvement Program
ANPROCA	Agence Nationale de la Promotion Rurale et du Conseil Agricole
CERIS	Center for Environmental and Regulatory Information Services
CSA	Climate-Smart Agriculture
ENAE	Ecoles Nationale de l'Agriculture et Elevage
ENABOF	Ecole Nationale de l'Agriculture et Elevage - Bofa
ENAKAK	Ecole Nationale de l'Agriculture et Elevage - Kakan
ENAMAC	Ecole Nationale de l'Agriculture et Elevage - Macenta
ENATEF	École Nationale des Agents Téchniques des Eaux et Forêts
ENATOL	Ecole Nationale de l'Agriculture et Elevage - Tolo
FEWS	Famine Early Warning System
IFPRI	International Food Policy Research Institute
IRB	Institutional Review Board
ISAV/F	Institut Supérieur Agronomique de Faranah
PRA	Participatory Rural Appraisal
WHO	World Health Organization

Executive Summary

Women in Guinea play a substantial, but usually unrecognized and unsupported, role in agriculture. This role in increasingly burdened by climate change and trends such a labor migration. Purdue partnered with Winrock International and the Institut Supérieur Agronomique de Faranah (ISAV/F) to identify farming practices by gendered division of labor throughout Guinea. To do this, Winrock International and Purdue University's International Programs in Agriculture – the implementers of USAID/Guinea's ***Agriculture Education and Market Improvement Program (AEMIP)*** have used, adapted and applied a survey instrument developed by the International Food Policy Research Institute (IFPRI), and created a database to enter the data resulting from the survey, which we have gathered throughout Guinea in partnership with the Ecoles Nationale de l'Agriculture et Elevage (ENAE). This report provides information from the data on gendered farming practices by region, and we expect later to overlay biophysical information about soils and other natural resources. Once we have mapped the information in this report, and have overlaid the additional information, AEMIP partners and other Guinean stakeholders will be able to make recommendations for gender-aware climate change adaptations.

This document is a report of the processes, results, recommendations, and expectations for ISAV's leadership of gender-sensitive climate change adaptations for Guinea, by geographic region. This research was conducted in coordination with agricultural certificate institutions (ENAEs), and other government and NGO stakeholders.

We wish to thank Ruth Meinzen-Dick and her colleagues at the International Food Policy Research Institute (IFPRI) for allowing us to use their survey for our needs in Guinea. You can find the description of the IFPRI and International Water Management Institute (IWMI) project, in the report called *Putting Gender on the Map: Methods for Mapping Gendered Farm Management Systems in Sub-Saharan Africa*, 2012.[1]

Background

USAID/Guinea's ***Agriculture Education and Market Improvement Program (AEMIP)*** is a four-year project that aims to strengthen the capacity of agriculture education in Guinea to respond to the growing needs of farms and agriculture enterprises in the face of shifting markets and climate change. Through this program, **Winrock International** and **Purdue University** work in partnership with the **Institut Supérieur Agronomique de Faranah (ISAV/F)**, as well as agriculture stakeholders and local and regional educational and environmental institutions, promoting sustainable agricultural practices and appropriate technologies among Guinean farmers. Our vision is for ISAV/F to be a recognized West African regional leader for best practices and research in promoting gender-sensitive climate change adaptations.

[1] http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.226.8298&rep=rep1&type=pdf

Through AEMIP, Winrock and Purdue University have focused primarily on organizational capacity building of ISAV/F, Guinea's only agriculture university, we have also helped to strengthen important linkages with the five certificate-level AET institutions across Guinea: including four Écoles Nationale de l'Agriculture et Elevage (ENAE) in Boffa, Kankan, Macenta, and Tolo; and, the École Nationale des Agents Téchniques des Eaux et Forêts (ENATEF) to strengthen AET curricula and faculty credentials to ensure they can help shape a better future for Guinea as market-responsive, gender-transformative, and climate-smart institutions.

Purdue Gender Training

The Purdue project implementation team includes a gender specialist, Andrea Burniske, who provided three trainings on gender integration into (especially) ISAV/F extension and engineering projects and practices. An introductory gender and climate-smart agriculture (CSA) training was provided by WebEx[2] to ISAV/F faculty in December 2014, when Winrock had instituted travel restrictions following the World Health Organization (WHO) guidelines in response to the Ebola outbreak. The first in-person TOT was conducted with more than 25 ISAV/F faculty to promote the development of skills in gender integration, including problem-solving, decision-making; critical thinking; root cause analysis; gender analysis with Participatory Rural Appraisal (PRA) tools; risk assessment; and, participatory scenario planning related to the impacts of climate change and gender at the community level. The training included many practical exercises that allowed participants to apply critical thinking skills around gender, including community training, group presentation of lessons learned and integration of approaches, methodologies, and tools into course outlines. One these tools was the Institute for Food Policy and Research Institution (IFPRI) gender mapping tool.

After faculty received training on the tool, and went through a practice session in which they took the survey themselves, these faculty participants applied the survey with 60 farmers from the local community. This training was the first step in developing ISAV/F's capacity to conduct research among communities, in order to apply it to the development of Guinean climate smart and gender sensitive agricultural strategies.

The Formal Survey Application with ISAV/F

Ms. Burniske returned in November 2016 to train selected ISAV/F faculty to lead a national study to map gendered farming practices by region engaging four Ecoles Nationale de l'Agriculture et Elevage (ENAE), École Nationale des Agents Téchniques des Eaux et Forêts (ENATEF) and the Agence Nationale de la Promotion Rurale et du Conseil Agricole (ANPROCA) to apply this survey with local farmer organization members. Preparation for the survey was led by Ms. Burniske, who ensured the collection of prepared and submitted documents to the Purdue University Institutional Review Board (IRB) on Human subjects' research; and worked with the Purdue Center for Environmental and Regulatory Information Services (CERIS) to slightly adapt the survey (in some cases clarifying questions), to add drop-down menus for

[2] https://www.webex.com/

agricultural products, using a survey tool called Qualtrix. CERIS developed a database to create reports from the surveys. ISAV/F students and staff were trained to enter information using iPads to access the Qualtrix survey.

During the November 2015 training on the gendered farming practices, Ms. Burniske and the ISAV/F faculty and ENAE participants reviewed the survey tool and tightened up details for the research plan. The faculty and ENAE researchers were charged with facilitating survey completion at each table of 7 respondents, to ensure that the survey questions were understood, and the surveys were completed in their entirety. This was important to the process, as many respondents would be semi-literate – especially in French, which was the language of the survey. Moreover, the process of data collection from surveys was completely new to the respondents (as well as to many researchers). We foresaw that norms for completing surveys would not be understood, and therefore facilitation was an essential role for ensuring quality data.

Upon completion of the training in November, Ms. Burniske and the ISAV/F and ENAE researchers conducted the first survey of farmer organizations at the ISAV/F campus. Throughout the month of November, ISAV/F researchers led the collection of data with their ENAE colleagues at each ENAE center, collected a total of **425 survey responses,** (including those from Faranah) of which 165 respondents (38%) were female, and 260 (62%) were male. The respondents were mostly farmers and farmer members of producer associations, and a smaller number (128 in total), were agricultural extension agents, agricultural faculty, and agricultural input suppliers).

The surveys were coded with the acronym of the ENAE from which they were collected. Also included were ENATEF, ISAV Faranah Faculty (ISAVFF) and ISAV Faranah Community (ISAVFC). No personal identifiers were associated with the surveys.

The ENAEs were coded as follows (also included are the corresponding Guinea **livelihood zones** from Famine Early Warning Systems Network [FEWS][3] – in order to show the ENAEs, ENATF and ISAV/F coverage zone locations in relation to these):

- ENABOF (Bofa, corresponding to livelihood zones 1 and 2 in Coastal Guinea)
    - For the Boké – Boffa – Koba-Tatema subprefecture there are 40 responses.
    - For the Boké – Boffa – Boffa-Centre subprefecture there are 27 responses.
- ENAKAK (Kakan, corresponding to livelihood zones 7 and 8 in Upper Guinea)
    - For the Kankan – Kankan – Kankan-Centre subprefecture there are 42 responses.
    - For the Kankan – Kankan – Gbérédou-Baranama subprefecture there are 6 responses.
- ENAMAC (Macenta, corresponding to livelihood zones 10 and 11 in Forest Guinea)
    - For the Nzérékoré – Macenta – Macenta-Centre subprefecture there are 55 responses.

[3] http://www.fews.net/west-africa/guinea/livelihood-description/june-2013

    - For the Nzérékoré – Macenta – Sérédou subprefecture there are 6 responses.
- ENATOL and ENATEF (Tolo, corresponding to livelihood zones 3, 4, 5, and 6 in Middle Guinea)
    - For the Mamou – Mamou – Tolo subprefecture there are 68 responses.
    - For the Mamou – Mamou – Mamou-Center subprefecture there are 58 responses.
    - For the Mamou – Mamou – Konkouré subprefecture there are 11 responses
- ISAVFC and ISAVFF (Faranah, corresponding to livelihood zone 9 in Upper Guinea)
    - For the Faranah – Faranah – Faranah-Center subprefecture there are 65 responses.
- All remaining sub-prefectures are grouped into a set of 47 responses for data gathered from the database, where the zones are broken down by political divisions. This data is more detailed, but more difficult to organize by center (coded location). Due to the organization of the data by the center (ENAEs, etc.), Qualtrix data was referenced the most because it permitted data entry by coded center.

Data and Findings

Quality and Caveats

Beyond gathering gendered farming practices data for the purpose of proposing climate change adaptation recommendations, we have viewed this exercise as an opportunity to build ISAV faculty's capacity to conduct extension field research. Our expectations were to use this research project as an opportunity for ISAV/F faculty to apply gender considerations and observe the impact that these consideration have on the quality of information in the report. Because this was the first time that faculty had undertaken this kind of research, we faced some initial challenges in the process of collecting of good data.

After the first collection of surveys from participants in Faranah, and entry of the results by the enumerators, Ms. Burniske reviewed the process with the two groups (researchers and enumerators). In entering the data with the enumerators, we found that the facilitating researchers had not, in fact, ensured completion of the survey instruments and there were incomplete data in all surveys. The enumerators learned the importance of correctly filling out surveys as they attempted to 'interpret' responses. In some cases this was easy to do, and did not have an impact on the data at all. In other cases we were unable to obtain as good data as we would have liked for Faranah. In a review meeting with enumerators and researchers we discussed the problems we encountered. We reminded the researchers that they were to lead this process, and the quality of the final report would impact the reputation of ISAV/F. We identified procedures to reduce the likelihood of incomplete surveys, such as having facilitators check surveys for completeness before respondents were allowed to collect their travel compensation. By all reports, subsequent data collection resulted in complete surveys.

What the data tell us

An assumption was made that distance was likely a consideration for the researchers in organizing participant respondents, because from the set of data it is clear that the respondents tended to come from towns closer to the ENAEs, ENATEF and ISAV/F. Hence we do not have responses from farmers located in some of the further outlying livelihood zones (5, 6, 8 and 11). These zones might have yielded more variations in responses given their proximity to borders with other West African countries, and therefore different ethnic groups.

Religion

Islam was the dominant religion identified in all areas surveyed, with the exception of the Macenta ENAE in the forest region of guinea, where 54 of 69 respondents noted that Christianity was also a common religion for this area. Eleven of those respondents also claim that indigenous beliefs are common in the area. While this is not a large number, respondents (6) from only one other ENAE (Kakan) claimed the presence of adherents of indigenous beliefs.

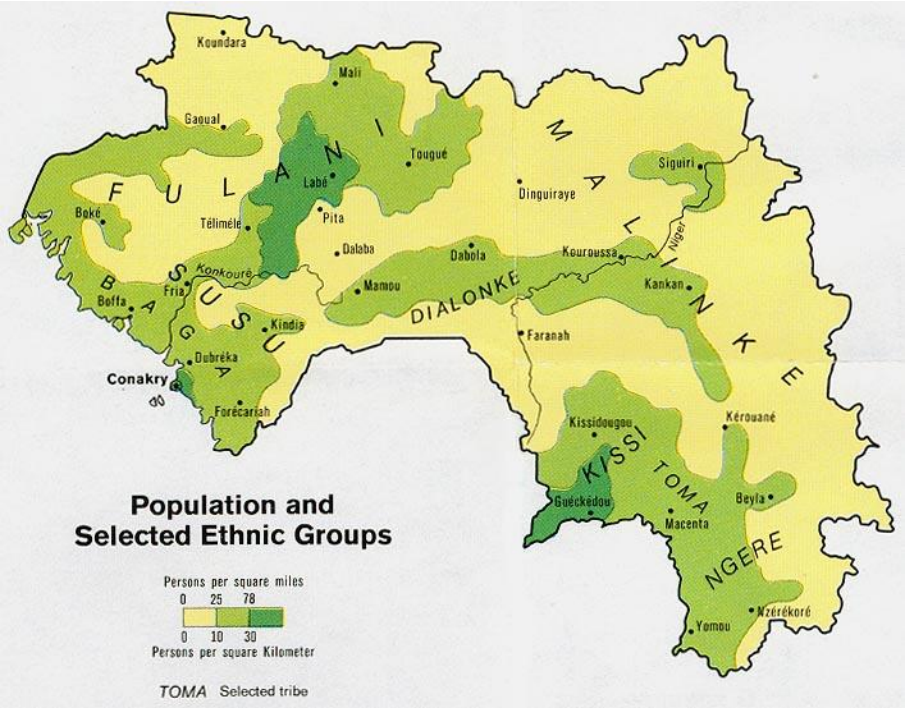
Ethnic Groups

Ethnic groups were identified as below the graphic, which was provided to contrast with the respondents claims/perceptions. Note that ethnic groups often have more than one name, and can also comprise sub-groups of larger ethnic groups. In *Unmasking the State, Making Guinea Modern*, author Mike McGovern[4] notes that ethnicity in Guinea was more fluid prior to French colonization. The author focuses on the Macenta region writing about the concept of 'ethnicized territory' – a new notion at the time, meaning that as a result of French colonization, "ethno-linguistic identity and specific parcels of territory were organically linked. Rather than the mosaic of relations between first-coming and later-arriving individuals and lineages…,[5]" which had been the case prior to colonization.

[4] McGovern, Mike. Unmasking the State: Making Guinea Modern. Chicago: University of Chicago Press, 2012

[5] Ibid, p. 85

Graphic 1: Distribution of ethnic groups[6]



Data from Qualtrix (the AEMIP Study), with number of respondents who assert the presence of these ethnic groups

ENABOF: Baga (48), Susu (69)

ENAKAK: Peulh/Fulani (21), Malinké (68)

ENAMAC: Peulh/Fulani (19), Guerzé (20), Koniague (22), Kissi (30), Malinké (52), Torma (59)

ENATOL/ENATEF: Peulh/Fulani (138)

ISAV: Kissi (20), Susu (26), Peulh/Fulani (49), Malinké (66),

Female-headed households. Respondents consistently reported that around twenty-five percent of the households were headed by single females, either de facto or de jure. ISAV faculty and ENAE respondents expressed during the survey training that they felt this percentage was actually much less – perhaps closer to 10%, but that this lower percentage was not provided as a choice in the survey. There is, therefore, an opportunity for increased precision in future use of the survey tool. Given the structure of Guinean extended family compounds on clan lands, it is likely that households are headed by women whose younger male relatives and husband have migrated to urban areas for labor, but where older male decision-makers remain.

Table 5a. Formally (De Jure) Female Headed HHs

[6] University of Texas at Austin: http://www.lib.utexas.edu/maps/guinea.html

#	Answer		Response	%
1	0		32	8%
2	.25		371	87%
3	.50		19	4%
4	.75		3	1%
5	1.00		0	0%
	Total		425	100%

Table 5b. Functionally (De Facto) Female Headed HHs

#	Answer		Response	%
1	0		54	13%
2	.25		339	80%
3	.50		26	6%
4	.75		6	1%
5	1.00		0	0%
	Total		425	100%

Land Tenure.

Table 6. Land Control by Gender (all regions)

#	Answer		Response	%
1	Male clan		180	43%
2	Female clan		5	1%
3	Men only		102	24%
4	Women only		11	3%
5	Men and Women together		119	28%
6	Not Available		6	1%
	Total		423	100%

Table 7. Land Ownership

		ENABOF	ENAKAK	ENAMAC	ENATOL	ENATEF	ISAVFF	ISAVFC	Total
	Statutory (legal title)	9	4	2	2	2	0	2	21

4.1.3 Under what kind of land tenure system are these plots hold?	Customary Tenure	36	62	58	47	55	4	57	320
	Public Property	23	2	5	16	3	0	3	52
	Lease (share-cropping)	2	1	4	8	6	0	8	29
	Total	70	69	69	73	66	4	70	422

Gendered Management of Farming Systems

It was not a surprising finding, that the farm systems throughout Guinea are controlled by males. Land is traditionally held through the male members of the clan, and under a clan leader. In some parts of Guinea this arrangement is more fluid with respect to working the land, and making decisions about crops or animals. In the Forest Region, for example, where there are the most claims of female-managed farming systems.

Table 1. Gendered Management of Farming Systems

		ENABOF	ENAKAK	ENAMAC	ENATOL	ENATEF	ISAVFF	ISAVFC	Total
Overall gender pattern in agriculture	MALE-MANAGED:	57	62	40	33	42	3	59	297
	FEMALE-MANAGED:	6	5	16	3	2	0	6	38
	SEPARATELY-MANAGED:	0	0	1	0	3	0	0	4
	MIXED OR JOINTLY MANAGED:	8	4	12	37	19	1	5	86
	Total	71	71	69	73	66	4	70	425

Table 2. Primary Agricultural Sectors, by Field Station

		ENABOF	ENAKAK	ENAMAC	ENATOL	ENATEF	ISAVFF	ISAVFC	Total
CROP FIELDS:	Yes	71	69	69	73	66	4	70	423
	No	0	2	0	0	0	0	0	2

		ENABOF	ENAKAK	ENAMAC	ENATOL	ENATEF	ISAVFF	ISAVFC	Total
	Total	71	71	69	73	66	4	70	425
HOME GARDENS	Yes	62	36	57	73	66	3	53	351
	No	9	35	12	0	0	1	17	74
	Total	71	71	69	73	66	4	70	425
FOREST AND WOODLOTS	Yes	43	12	57	61	63	3	46	286
	No	28	59	12	12	3	1	24	139
	Total	71	71	69	73	66	4	70	425
PASTURES	Yes	20	3	25	60	64	2	31	206
	No	51	68	44	13	2	2	39	219
	Total	71	71	69	73	66	4	70	425
LARGE LIVESTOCK	Yes	10	15	26	52	48	2	43	197
	No	61	56	43	21	18	2	27	228
	Total	71	71	69	73	66	4	70	425
SMALL LIVESTOCK AND POULTRY	Yes	60	19	59	66	64	3	38	310
	No	11	52	10	7	2	1	32	115
	Total	71	71	69	73	66	4	70	425
FISHERIES AND AQUACULTURE	Yes	54	1	36	15	4	1	37	149
	No	17	70	33	58	62	3	33	276
	Total	71	71	69	73	66	4	70	425

Results by aggregating all regions show that field crops are important for all regions

Table 4. Primary Livelihoods for Each Gender: All regions

#	Question	Women	Men	Both	Total Responses
2	Cropping (food crops: home consumption and sale)	73	100	247	420
3	Cropping (food crops: mostly home consumption)	82	155	167	404
1	Cropping (mostly cash crops)	39	190	162	391
9	Non-timber forest products	101	84	138	323
6	Agricultural Wage labor	21	170	121	312
4	Livestock/Dairy	74	37	196	307
7	Non-farm activities	66	73	153	292
8	Seasonal migration	12	140	104	256
5	Fishing and Aquaculture	60	50	143	253
10	Other	10	13	24	47

Aggregated results show that generally:

- Males manage all *production* but of groundnuts.
- Females manage all *sales* but for coffee and cola nuts.
- Males manage all *income* from crops.

Regionally there are slight variations.

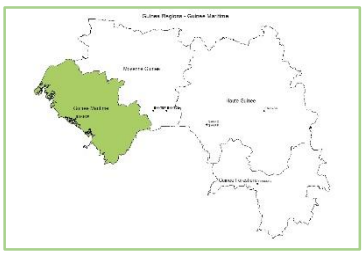
In a breakdown of results by region, it is clear that **agricultural wage labor** is a significant source of income for ENAKAK, ENAMAC and ISAVFC field station regions. Men are more involved in this in all field station areas, except for ENATEF and ISAVFC where it is both women and men. **Non-Farm Activities** are a significant source of income for males and females in ENAKAK, ENAMAC and ISAVFC. **Seasonal Migration** is a significant source of income in ENAKAK and ISAVFC field station regions, but somewhat less important in ENAMAC regions. Mostly men undertake seasonal migration in ENABOF, ENAMAC and ENATOL, whereas both men and women do so in ENAKAK, ENATEF and ISAVFC regions.

Main Agricultural Income Sources by Region

Livelihood sources listed under each field station code comprise the important income source by corresponding FEWS livelihood zone regions. 'Our data' (from Qualtrix) are organized by number of respondents who assert the importance of these crops. Next to this listing is the average amount of land that smallholders work, according to the majority of respondents.

Under this for each field station code are the results from field station respondents.

ENABOF (FEWS livelihood regions #1 and #2: Rice, Fishing, Groundnut, Palm Oil, and Horticulture)



Field Crops: **Our data**: Palm fruit (26), Fishing (54), Small Livestock 60), Groundnuts (61), Cassava (65), Rice (71) - **.5 – 1 ha**
Field crops are important sources of income in ENABOF field station areas, and are reportedly managed mostly by males there. The field crop lands are said to be jointly managed by males and females.

Decisions and tasks such as purchases, labor force management, selection of seeds, weeding, and processing of crops are undertaken jointly. Males undertake pest control and

irrigation of field crops, and also predominantly do the harvestings. As is other regions, post-harvest storage for field crops is overwhelming said to be done by males. Sales of field crops is overwhelming said to be done by women in all areas.

Home Gardens **Our data**: Okra (20), Vegetables (28), Sweet Potato (41), Bananas (43), Cassava (44)
Home gardens are said to be primary enterprises especially with respect to ENABOF, and these home garden crops are said to be managed jointly. There is no consensus about whether males and females manage separate or the same home garden plots.

As with other farm tasks, males are more likely to be in charge of most activities, such as hiring and managing the labor force, as well as applying inputs. Males are said to make purchasing decisions and to undertake heavy work such as plowing. Males alone are said to irrigate these home gardens in ENABOF field station areas.

Males and females plant in ENABOF regions, and seed selection is done equally between men and women responsibility. As with field crops, weeding is a shared tasks. There is no clear division of labor for harvesting of home garden crops. Respondents mark females or both as responsible for this task, and gendered divisions of labor for harvesting home gardens are likely dependent on the type of crop. Both males and females carry out post-harvest storage tasks, and both may process products from home gardens. Females alone tend to sell the products from home gardens.

Forest/Woodlots **Our data**: Medicinal Plants (24), Tree Bark (34), Wild Fruit (39)
Woodlots are an important farm enterprise**,** though woodlot sizes are small - less than .5 ha and are held under customary tenure where male clans or lineages control these lands. Both males and females share the woodlots in undertaking their productive activities. Males make purchase and other money-related decisions, such as hiring of labor force, seed selection, and planting.

Other forest and woodlot production activities are said to be divided as follows:

- Males control use of inputs such as pesticides and fertilizers.
- Harvesting is said to be undertaken by males exclusively.
- Post-harvest storage is undertaken by both in ENABOF field stations' areas.
- Responses indicate that both men and women process forest products.
- Males and females are more equally involved in selling forest products, but females appear to have more primary responsibility for this.

Non-Forest Timber Products (NTFPs) are not said to be important in ENABOF field station regions, yet the products listed under forest/woodlot products are just those.

Pasture Lands
Pasture lands (used for grazing) are not considered an important farm enterprise in ENABOF (2/3 no and 1/3 yes responses). This might be due to perception as pasture lands as only for grazing, and not as a crop income source.

Livestock and Dairy
Large livestock and dairy are not considered important agricultural activities in BOF.

Small livestock: **Our data**: Chickens for Meat (20), Sheep (23), Ducks (24), Fowl (43), Goats (46)

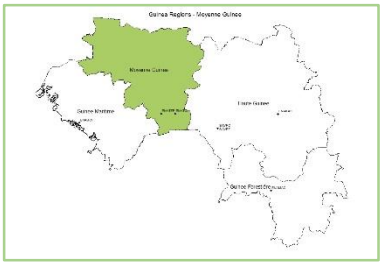
Small livestock, which in this survey comprises poultry as well, are said to be an important farm enterprise in ENABOF. Responses about 'herd' size are fairly even between 5 – 50 animals. The size variability is likely because of the inclusion of poultry and smaller animals.

Men and women together, or only men, decide which small livestock to purchase. Purchasing (inputs) decisions are made by men and women, or men alone (not by women alone).

- Men hire and manage labor force, are responsible for herd management/animal health, and men build and repair shelters.
- Women clean barns and sheds and do the milking of small livestock.
- Both men and women prepare feed for, and provide it to, these animals, but women provide water
- Women, or women and men, store products and by-products. Women, or women and men both, also process for sale/consumption and sell products or by-products. This is possibly based on types of product where women might store eggs and milk, and men store meat.

Fishing and Aquaculture **Our data**: Catfish (33), Dorado (41), Tilapia (42)
Fishing and Aquaculture are an important source of income in ENABOF field station areas. Activities related to this are undertaken by both men and women. Fish are captured wild, and the average catch size in ENABOF is more than 100 fish or other aquatic species. Men and women together are said to own the fishing equipment/enterprises, and women alone, or men and women, process and sell fish.

ENATOL/ENATEF (FEWS livelihood regions #3, #4, #5, and #6)
(Rice, Groundnuts, Fonio, Horticulture, Livestock)



Field Crops Our data[7]: Large livestock (52/48), Small Livestock (66/64), Fonio (99), Cassava (114), Groundnuts (115), Maize (119), Rice (135)
ENATOL - .5 – 5 ha, **ENATEF – less than .5 – 1**

Field crops are important sources of income, and are reportedly managed jointly in ENATOL/ENATEF regions. The field crop lands are said to belong to men or to the male clan/lineage, with men reportedly making purchase decisions, managing labor force, selecting seeds, planting, and undertaking pest control and irrigation. Both weeding and harvesting are done jointly in ENATOL/ENATEF regions, but post-harvest storage is undertaken by males. Processing crops for sale is done jointly, but sales of field crops is an activity for women.

Home Gardens Our data: Cow Pea (23), Bananas (25), Potato (35), Rice (37), Taro (48), Okra (53), Maize (53), Vegetables (62), Sweet Potato (86), Cassava (95)

[7] The data for the field crops is aggregated for ENATEF and ENATOL

Home gardens are a primary enterprise, and are said to be managed jointly. There is no consensus about whether males and females manage separate or the same garden plots.

As with other farm tasks, males are more likely to be in charge of most activities, such as hiring and managing the labor force, as well as applying inputs. Respondents from ENATOL claim that males make purchasing decisions, but respondents in ENATEF claim this seems to be is jointly undertaken. Heavy work such as plowing is undertaken by men, or shared. Irrigation is said to be undertaken by females alone in ENATEF areas, but respondents from ENATOL claim that this task is shared.

Males and females select seeds, and plant in home gardens of ENATOL field station regions, but females are more likely to do this according to ENATEF respondents. Women alone undertake weeding in both field station areas.

There is no clear division of labor for harvesting of home garden crops. Respondents mark females or both as responsible for this task, and gendered divisions of labor for harvesting home gardens are likely dependent on the type of crop.

There is a marked difference in responses about who carries out post-harvest storage tasks. ENATOL respondents claim that men do this, and ENATEF respondents claim women have responsibility for this task. These two field stations are located in the same prefecture, but in different towns and with different focus areas: agriculture for ENATOL in Tolo, and Forestry for ENATEF in Mamou.

In ENATEF, respondents claim that females both process and sell the products from home gardens, whereas in ENATOL, respondents claim males and females share these tasks.

Forest/Woodlots: Our data: Wild Fruit (42), Feathers (66), Bush Meat (73), Medicinal Plants (88), Honey (90), Neri (97)

Woodlots are noted to comprise an important farm enterprise in ENATOL and ENTEF regions, where average lot size exceeds 10 hectares. These plots are said to be located on public property where males and females are said to share control. Males and females share the woodlots in undertaking their productive activities, but males make purchase and other money-related decisions, such as hiring of labor force, seed selection, and planting.

Control of use of inputs such as pesticides and fertilizers is said to be shared by males and females, as is harvesting. Post-harvest storage is said to be undertaken by males alone in ENATOL, and by both in ENATEF field stations' areas. Males and females are more equally involved in selling forest products than other products, but females appear to have more primary responsibility for this (because the responses are divided between 'women only' and 'both men and women'). Responses from ENATEF indicate that both men and women process forest products, but for ENATOL respondent, men lead in this.

Non-Forest Timber Products (NTFPs) are an important source of income for both men and women. Neri, the most important NTFP here, is also a product for which women are said to control the income.

Pasture Lands

Pasture lands (used for grazing) are only clearly important in ENATEF and ENATOL regions. ENATEF and ENATOL respondents claim that males and females manage these lands together (it is public property), and pasture lands are greater than 10 ha. Secondary uses for these lands are gathering wild berries, nuts

and plants. Men make purchasing and labor force decisions. Pasture lands are not used for growing animal feed for sale, but only for pasturing animals. Respondent from ENATEF claim that both men and women manage the animals on pasture lands, but for ENATOL slightly more than half of the respondents claim men manage them. Both men and women may sell the animals from these lands. It is not clear whether the sales are of live animals. Both men and women 'process' the animals, but generally animals are sold live. Unless it is for a festive occasion, slaughtering general has some degree of formal centralized butchering process, controlling the sale of the meat.

Livestock and Dairy: **Our data:** Cattle for Meat (68), Cattle for Dairy (96)

Large livestock and dairy are important agricultural activities in ENATEF/ENATOL, where the average herd size is reportedly 5 – 10 animals. These herds are reported as being managed jointly. Men and women together are said to own these animals, but men make purchasing decisions, as well as labor force decisions. Women clean sheds ad barn. Men and women manage and sell large animals. Men control the sales of meat cattle, and they control the income from both dairy and meat cattle.

Small livestock: **Our data:** Sheep (41), Chicken as Layers (52), Ducks (52), Chicken for Meat (62), Fowl (65), Goats (124)

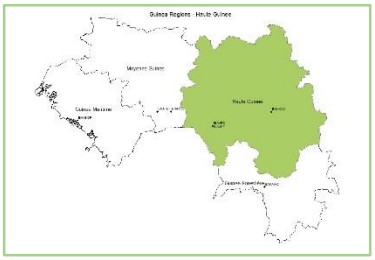
Small livestock, which in this survey comprises poultry as well, are said to be important agricultural enterprise activities. The average size of 'herd' is 5 – 50 animals. The size variability is likely because of the inclusion of poultry and smaller animals.

Men and women together, or only men, decide which small livestock to purchase. Purchasing (inputs) decisions are made by men and women, or men alone (not by women alone).

- Men hire and manage labor force, are responsible for herd management/animal health, and men build and repair shelters.
- Women clean barns and sheds and do the milking of small livestock.
- Both men and women prepare feed for, and provide it to, these animals, but women provide water
- Women, or women and men, store products and by-products. Women, or women and men both, also process for sale/consumption and sell products or by-products. This is possibly based on types of product where women might store eggs and milk, and men store meat.

Fishing and Aquaculture
Fishing and Aquaculture are not an important source of income in ENATOL/ENATEF field station areas.

ENAKAK (FEWS livelihood regions #7 and #8 Maize, Rice, Fonio, Livestock, Gold-mining)



Field Crops: **Our data:** Mango (28), Fonio (48), Groundnuts (56), Cassava (64), Maize (70), Rice (70) **1-5 ha**

Field crops are important sources of income in ENAKAK field station regions, and are managed by both men and women there, but women are said to have separate fields. The field crop lands are said to belong to men or to the male clan/lineage. Men reportedly make purchase

decisions, manage labor force, select seeds, and plant. Pest control and irrigation are done by men and women. Men undertake harvesting of field crops as well as post-harvest storage. Women are said to be responsible for weeding fields, and processing and sales of field crops.

Home Gardens: Our data: Vegetables (24), Okra (27)

It is unclear whether Home Garden crops are a primary enterprise for ENAKAK. Respondents were split in their responses. Though those who claim it is an important enterprise say that women and men have separate plots. These plots are controlled by the male clan or lineage, under customary land tenure.

As with other farm tasks, males are more likely to be in charge of most activities, such as plowing and other heavy labor, irrigating, and hiring and managing the labor force, and applying inputs. Purchasing decisions are jointly undertaken.

Males and females plant home garden crops in ENAKAK field station regions, but seed selection responses are almost equally dispersed for all categories (men only, women only, jointly). Women alone undertake weeding of home gardens. There is no clear division of labor for harvesting of home garden crops. Respondents mark females or both as responsible for this task, and gendered divisions of labor for harvesting home gardens are likely dependent on the type of crop. Likewise, responses are divided about who carries out post-harvest storage tasks. A very close number of respondents claim males or females carry out this task.

Females are said to both process and sell the products from home gardens in ENAKAK field station areas. Okra and horticultural vegetables (tomatoes, aubergine, onion) are some of the few products for which women control the income, and so that these comprise the products of home gardens in ENAKAK areas is important to note.

Forest/Woodlots
Woodlots are not said to comprise an important farm enterprise in ENAKAK, where 'no' is marked. However, non-timber forest products are said to be an important source of income and are the responsibility of females alone. These products for Kankan are **Neri, Peppers, and Honey.**

Pasture Lands
Pasture lands (used for grazing) are not said to comprise an important farm enterprise in ENAKAK

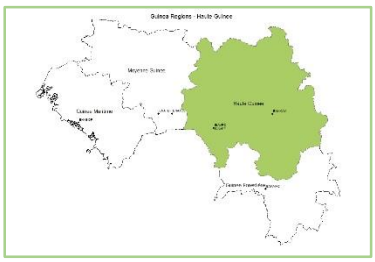
Livestock and Dairy: **Our data**: Cattle for Meat (14), Cattle for Dairy (16)

Large livestock and dairy are said to be important agricultural activities in ENAKAK, where the average herd size is reportedly 5 – 10 animals. These animals are reported as being managed jointly. Men and women together are said to own these animals, but men make purchasing decisions, as well as labor force decisions. Women clean sheds and barns. Men and women manage and sell large animals. Though large livestock are said to be an important agricultural enterprise in Kankan, the numbers are not high in the breakdown of respondents who claim the importance of these animals. Numbers are actually higher for sheep (below – 20).

Small livestock:
Small livestock, which in this survey comprises poultry as well, are not said to be important for ENAKAK field station regions, though respondents note a small production of **chickens, ducks, goats and sheep.**

Fishing and Aquaculture
Fishing and Aquaculture are not an important source of income in regions served by ENAKAK.

ISAVFC (FEWS livelihood region #9 Rice, Cassava, Groundnuts)



Field Crops: **Our data**: Mango (17), Fishing (37), Large Livestock (43), Maize (53), Fonio (54), Cassava (60), Groundnuts (64), Rice (68) **1-5 ha**

Field crops are important sources of income ISAVFC regions, and are reportedly managed mostly by males, but women are said to have separate field crops. The field crop lands are said to belong to men or to the male clan/lineage.

Men reportedly make purchase decisions, manage labor force, select seeds, and undertake pest control. Irrigation, harvesting, and processing of field crops is said to be performed jointly. Post-harvest storage for field crops is said to be done by males. Weeding of crop lands is women's work, as is sales of field crops.

Home Gardens**: Our data:** Rice (29), Cassava (38), Sweet Potato (42), Vegetables (43)

Home Garden crops are said to be managed jointly as a primary enterprises for ISAVFC-served areas. ISAVFC respondents claim that women and men have separate plots.

As with other farm tasks, males are more likely to be in charge of most activities, such as hiring and managing the labor force, as well as applying inputs. Males are said to make purchasing decisions, undertake heavy work such as plowing. Females alone are said to weed and to irrigate these gardens in ISAVFC areas.

Males and females both plant home garden crops and seed selection follows an equal distribution of responsibility. There is no clear division of labor for harvesting of home garden crops. Respondents mark females or both as responsible for this task, and gendered divisions of labor for harvesting home gardens are likely dependent on the type of crop. Responses are divided about who carries out post-harvest storage tasks. A very close number of respondent claim males or females carry out this task. Females both process and sell the products from home gardens.

Forest/Woodlots **Our data**: Feathers (22), Neri (31), Medicinal Plants (30), Bush Meat (33), Honey (22)

Woodlots are noted to comprise an important farm enterprise in ISAVFC regions, where such lots average 1-5 ha. Forested lands are held under customary tenure and the male clan or lineages control use of these lands. ISAVFC respondents were divided over whether men and women share woodlot lands: An even number claim they share use, as claim they have separate plots.

Males make purchase and other money-related decisions for woodlots, such as hiring of labor force and seed selection. Males alone undertake use of inputs such as pesticides and fertilizers, planting, and post-harvest storage.

Harvesting and processing is said to be undertaken by both males and females, Males and females are also more equally involved in selling forest products than other products, but females appear to have more primary responsibility for this (because the responses are divided between 'women only' and 'both men and women'). Non-Forest Timber Products (NTFPs) are an important source of income, and both males and females are involved in production activities of these. Women control income from Neri and to a certain extent, medicinal plants.

Pasture Lands

ISAVFC respondents were almost equally divided on the importance of pasture lands as a farming enterprise. This might be due to perception as pasture lands as only for grazing, and not as an income source. In ISAVFC, the male clan or lineage manage these lands under customary tenure. Men and women manage the same pasture lands, where grazing of large and small livestock is the most important use. ISAVFC respondents claim that the average size of pasture lands is 1-5 ha. Secondary uses for these lands are gathering wild berries, nuts and plants. Men make purchasing and labor force decisions. Both men and women manage and 'process' the grazing animals, but women alone sell them. It is not clear whether the sales are of live or slaughtered animals.

Livestock and Dairy: **Our data**: Cattle for Dairy (39), Cattle for Meat (42)

Large livestock and dairy are important agricultural activities in ISAVFC regions, where the average herd size is reportedly 5 – 10 animals, which are managed jointly. Men and women together are said to own these animals, but men make purchasing decisions, as well as labor force decisions. Women clean sheds and barns. Men and women manage and sell large animals. Males control the income from meat cattle, but women can control income at times from dairy sales.

Small livestock: **Our data**: Fowl (20), Chicken for Meat (23), Ducks (26), Goats (32)

Small livestock, which in this survey comprises poultry as well, are said to be important for ISAVFC areas. The average size of 'herd' is 5 – 50 animals. The size variability is likely because of the inclusion of poultry and smaller animals.

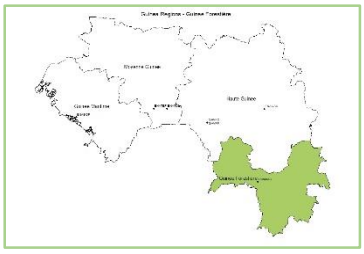
Men and women together, or only men, decide which small livestock to purchase. Purchasing (inputs) decisions are made by men and women, or men alone (not by women alone).

- Men hire and manage labor force, are responsible for herd management/animal health, and men build and repair shelters.
- Women clean barns and sheds and do the milking of small livestock.
- Both men and women prepare feed for, and provide it to, these animals, but women provide water
- Women, or women and men, store products and by-products. Women, or women and men both, also process for sale/consumption and sell products or by-products. This is possibly based on types of product where women might store eggs and milk, and men store meat.

Fishing and Aquaculture: **Our data:** Catfish (21), Tilapia (33)

Fishing and Aquaculture are an important source of income in ISAVFC field station areas. Activities related to this are undertaken by both men and women. Fish are captured wild, and the average catch size is 11-60 fish. Men and women together are said to own the fishing equipment/enterprises, and women alone, or men and women, process and sell fish.

ENAMAC (FEWS livelihood regions #10 and #11 Rice, Palm Oil, Coffee, Cassava, Livestock)



Field Crops: **Our data**: Palm fruit (33), Fishing (36), Groundnuts (45), Cassava (50), Maize (59), Small Livestock (59), Coffee (64), Rice (71) **1-5 ha**

Field crops are important sources of income ENAMAC regions, and are reportedly managed mostly by males. The field crop lands are said to belong to males and females jointly in these regions.

Men reportedly make purchasing decisions, manage the labor force, and undertake pest control and irrigation. Women and men select seeds, but women alone plant them. Women are responsible for weeding. Harvesting is done jointly, but post-harvest storage for field crops is said to be done by males. Processing of crops for sale, and sales of crops are said to be done by women.

Home Gardens: **Our data**: Sweet Potato Leaf (21), Rice (22), Bananas (23), Cowpea (24), Moringa Leaf, (24), Vegetables (24) Cassava (27), Okra (28), Sweet Potato (31)

Home Garden crops are a primary enterprise for ENAMAC regions, and are said to be managed by both men and women. There is no consensus about whether males and females manage separate, or the same, garden plots.

As with other farm tasks, males are more likely to be in charge of most activities, such as hiring and managing the labor force, as well as applying inputs. In ENAMAC areas plowing and planting is done by women, but seed selection and irrigation are shared tasks. Women are the ones who weed in these areas.

There is no clear division of labor for harvesting of home garden crops. Respondents mark females or both as responsible for this task, and gendered divisions of labor for harvesting home gardens are likely dependent on the type of crop. Responses are likewise divided about who carries out post-harvest storage tasks. A very close number of respondent claim males or females carry out this task. Females are the ones who both process and sell the products from home gardens. Females manage income from Cowpea, Okra, Vegetables, and Sweet Potato.

Forest/Woodlots**: Our data:** Cola (22), Mushrooms (22), Medicinal Plants (32), Wild Fruit (34), Tree Bark (41), Raphia Wood/Fronds (42), Bush Meat (48)

Woodlots are an important farm enterprise, comprising 1-5 ha in ENAMAC regions. These plots are said to be held under customary tenure, with the male clan or lineages controlling the use of these lands. Males and females share the woodlots in undertaking their productive activities.

ENAMAC respondents were divided on who makes purchase and other money-related decisions, such as hiring of labor force. Males and females select seeds and plant them, and both harvest and process wood products. Males control use of inputs such as pesticides and fertilizers, and exclusively undertake post-harvest storage. Women manage the income from mushrooms.

Males and females are more equally involved in selling forest products, but females appear to have more primary responsibility for this (because the responses are divided between 'women only' and 'both men and women'). Non-Forest Timber Products (NTFPs) are an important source of income for ENAMAC respondents, and men control the production of these.

Pasture Lands

Pasture lands (used for grazing) are not considered an important farm enterprise according to ENAMAC respondents. This might be due to perception as pasture lands as only for grazing, and not as an income source.

Livestock and Dairy

Large livestock and dairy are not important agricultural activities in ENAMAC areas.

Small livestock**: Our data**: Fowl (22), Sheep (24), Ducks (34), Chicken as Layers (35), Chickens for Meat (39), Goats (54)

Small livestock, which in this survey comprises poultry as well, are said to be important in ENAMAC field station areas. The average size of 'herd' is 5 – 50 animals. The size variability is likely because of the inclusion of poultry and smaller animals.

Men and women together, or only men, decide which small livestock to purchase. Purchasing (inputs) decisions are made by men and women, or men alone (not by women alone).

- Men hire and manage labor force, are responsible for herd management/animal health, and men build and repair shelters.
- Women clean barns and sheds and do the milking of small livestock.
- Both men and women prepare feed for, and provide it to, these animals, but women provide water
- Women, or women and men, store products and by-products. Women, or women and men both, also process for sale/consumption and sell products or by-products. This is possibly based on types of product where women might store eggs and milk, and men store meat.

Fishing and Aquaculture**: Our data:** Our data: Catfish (20), Tilapia (37)

Fishing and Aquaculture are an important source of income in for respondents in ENAMAC. Activities related to this are undertaken chiefly by women. Fish are captured wild, and the average catch size is 11-60 fish. Men and women together are said to own the fishing equipment/enterprises and women alone, or men and women, process and sell fish.

Changing livelihood patterns.

The survey included four open-ended questions, including perceptions of changing livelihood patterns. Respondents were mostly positive in their expressions of change in livelihoods in the past ten years, and in the increasingly active role that women play. There were many remarks about livelihoods improving because of access to agricultural inputs.

“With the use of fertilizers, herbicides and pesticides, there is a marked improvement in productivity which helps reduce the prices of agricultural products.” – Male respondent from Kankan

“Yes through the agricultural plan of the last 10 years we are able to meet 60% of our needs. Today children are in school and women are also in trade.” – Male respondent from Boké (ENABOF)

“Increasing crop yields, improved working means, acquisition of agricultural inputs, increased family income, introduction of new crop varieties (seed), acquisition of motorized vehicles for fishing, and modern nets.” – Male respondent from Boké (ENABOF)

Changing gender norms.

Many perceive that gender norms have changed and that women are taking greater responsibility in the household and in the labor force. Others perceive that women just have more work and nothing has really changed in terms of power.

“Gender roles: women work more than men, but their work is not recognized.” – Female respondent from Faranah

“Gender roles have changed following the adaptation of new cultivation techniques and livestock and this is encouraging.” – Male respondent from Boké (ENABOF)

“In my area, women increasingly do the agricultural activities, especially in the dry season (eggplant, pepper, onion, lettuce)” – Female respondent from Faranah

“Currently women play an important role in agricultural activities there through free enterprise income generating activity.” – Female respondent from Boké (ENABOF)

Another open-ended question sought to capture participants’ perceptions of the changing roles of males and females in agriculture, if they perceived changes at all.

“Women's earnings significantly changed in the diversification of activities she performs. This has a positive impact on households.” – Male respondent from Kankan

“Strengthening women's productive capacity through training and the creation of groups, women's participation in decision-making, and promoting the agricultural activities and reduction of household chores of women.” – Female respondent from Boké

“In recent years women's lives have been changed because men work better with women. Men accept women in taking family decisions” – Male respondent from Kankan

“Women's empowerment. The creation of women's groups.” – Female respondent from Boké (ENABOF)

“Yes gender roles have changed gradually as women take on more and more.” – Female respondent from Kankan

Migration.

The “… *feminization of the agriculture sector* is an important phenomenon in Guinea, likely the result of male-dominated rural out-migration. There are considerably fewer men than women in the 20 to 49 age brackets of the national agricultural population while the agricultural population

by age and sex of the country's Labé region indicates 4 times more women than men farmers in the 30 to 34 age category[8]." (2010, Ahearn and Tempelman)

In order to understand the regions that most strongly reflect the 'feminization of agriculture' in Guinea, we sought to capture the respondents' perceptions on incidence of migration in their communities. There was much disagreement among responses, however some zones were in the 'red' as far as migration, and only ENABOF clearly green (little migration, but many foreign immigrants):

- **ENABOF**: Of 70 comments, 29 respondents claim that migration is significant in their region or community. Many respondents confused 'migration' with 'immigration,' and referred to people from other countries competing with them for fish sales.
- **ENATOL/ENATEF**: Of 140 comments, 89 respondents claimed that migration is significant in their region or community.
- **ENAMAC**: Of 71 comments, 62 respondents claimed that migration is significant in their region or community.
- **ISAV/F**: Of 74 comments, 68 respondents claimed that migration is significant in their region or community.
- **ENAKAK:** Of 72 comments, 67 respondents claimed that migration is significant in their region or community.

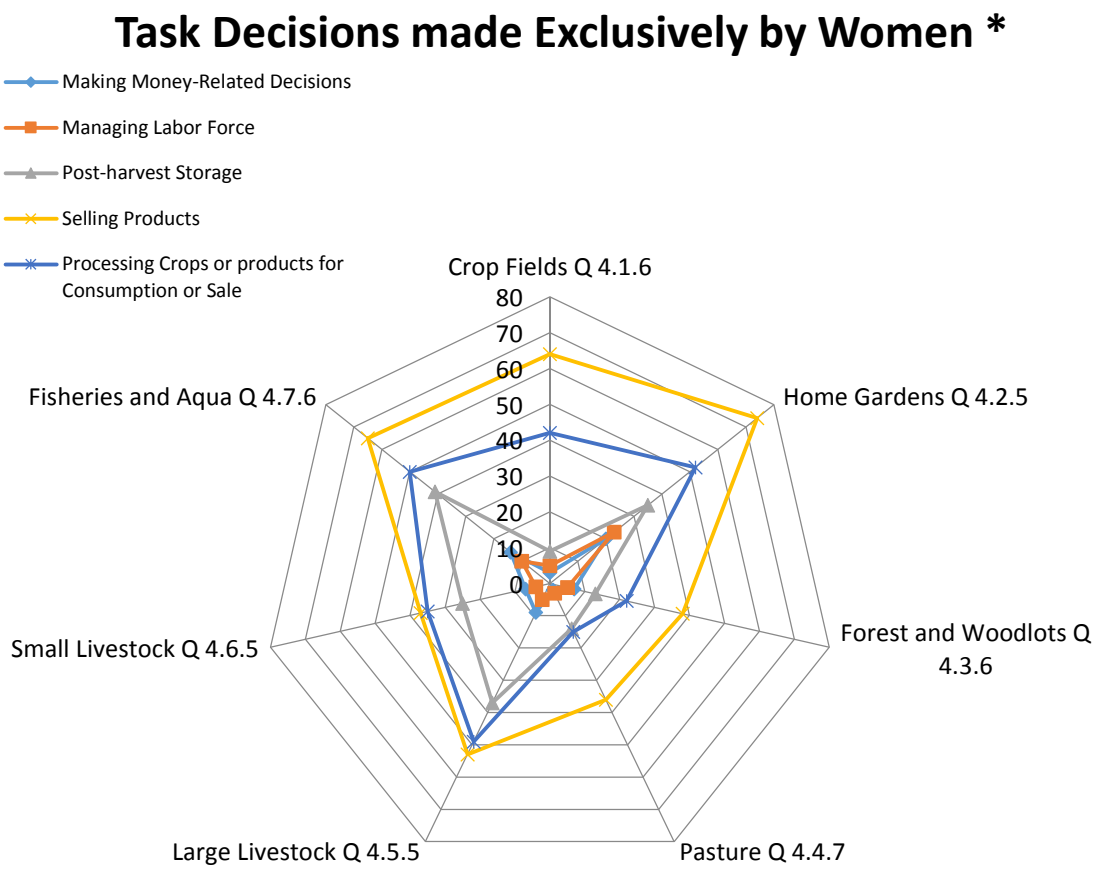
Respondents from regions most affected by migration repeatedly stressed the lack of 'bras valides' or 'able-bodied' workers.

- "There was migration within and around our area. The impact is marked and extra work. The weight of activities fell to the old and to women" – Male respondent from Faranah
- "Yes, there is significant migration, which caused a lack of manpower." – Male respondent from Faranah
- "Yes there is migration of 'able-bodied workers' to other areas which creates a decrease in the labor force and a decline in productivity, and the increase of labor in women" – Male respondent from Faranah
- "The migration of men and young people contribute to increase the burden on women who stay with the smaller children. Production will drop and food will be reduced" – Female respondent from Faranah
- "Yes migration is taken many men away to the mines or to the small village to go to work. This migration among men really impacts woman because they are the ones who do all the family work" – Female respondent from Nzérékoré (ENAMAC)
- "There has been a significant migration has had an impact on gender roles in the farming business" – Male respondent from Mamou
- "I think now young and able-bodied go to mining areas and abandon agriculture in favor of gold panning." – Male respondent from Kankan

8 http://www.fao.org/fileadmin/templates/ess/pages/rural/wye_city_group/2010/May/WYE_2010.4.2_Ahearn_Tempelman_rev.pdf

- "Yes there was a significant migration from this area and its impact is huge. For example if men move leaving only women there will be activities that women will not be able to do and eventually it weakens yeilds."- Female respondent from Mamou
- "Youth migration to the mining areas and to other places in search of easy money has a negative impact on production" – Male respondent from Kankan
- "Yes migration has had great impacts: labor scarcity (all young people and women go to the mines in search of well-being). The abandonment of agricultural areas" – Female respondent from Kankan**Decision-making and control.**

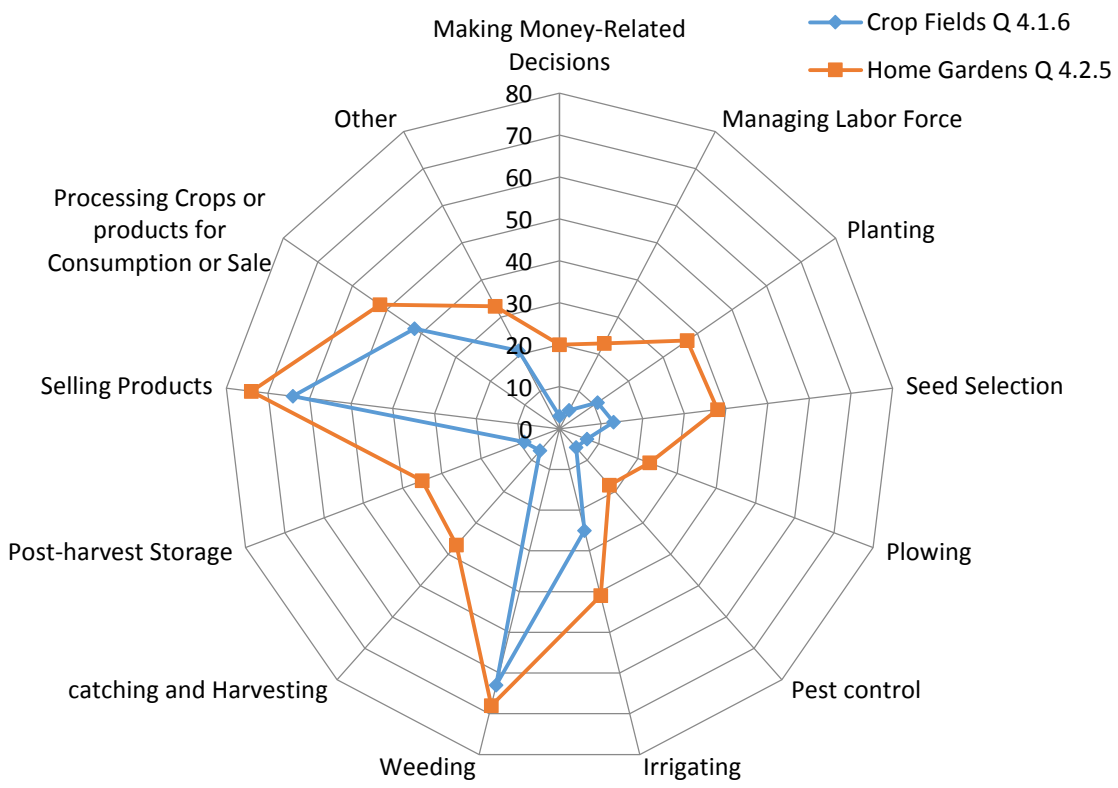
Across all farm types, women are most likely to be making decisions related to 1) Selling Products; 2)



* Comparing the Survey Percentages for Decisions that are Common to All Farming Types.

Processing Crops or Products for Consumption or Sale; and 3) Post Harvest Storage or processing.

In a comparison of survey results for “Crop Fields” and “Home Gardens”, women are more likely to be the decision makers with Home Garden Plots.



* Comparing the Survey Percentages for Decisions made for "Crop Field" and "Home Garden" Farming Types

What we need to know

In order to make climate change adaptation recommendations for agriculture and agricultural practices in Guinea, it is important to understand the following:

- Trends in land tenure and use
- Climate change (precipitation and temperature changes) predictions.
- Soil types per region.
- Tolerance of current crops and animals for increased temperature, humidity, and decreased/increased rainfall.

Aside from a consultant to undertake this work, our results can be matched with findings from the International Food Policy Research Institute publication *West African Agriculture and Climate Change A*

Comprehensive Analysis, Edited by Abdulai Jalloh, Gerald C. Nelson, Timothy S. Thomas, Robert Zougmoré, and Harold Roy-Macauley, 2013.

Recommendations and Next Steps

The data from this report reflect perceptions that most agricultural income activities are managed by men across the geographic areas sampled in Guinea. Though women overwhelmingly conduct sales of products, men mostly control the income from those sales. However, for three of the five regions covered by field stations and ISAV Faranah, responses to questions about changes in gender roles and in migration reveal that migration to cities and mines for day labor activities has taken younger men (and in some cases women as well) away from agricultural production. Women are increasingly left to manage both their homes and their farm activities, and yet according to sources few Guinean women have access to extension services to help them learn more sustainable production practices, nor do they have access to credit for purchasing machinery and inputs. Guinean women need access to low-cost, appropriate labor saving technology, and to extension services to help them learn new practices to increase yields while conserving soil and water. They may need to alter sowing times, crop density, and crop mixtures. They may also need access to improved, heat-resistant seed varieties. Or they may need to substitute the kinds of crops and animals they cultivate, depending on predicted changes in precipitation levels and temperatures for their regions.

ISAV/F and Winrock should undertake a focused effort to train female farmers in soil eco-system conserving agricultural practices through producers' groups, and to develop appropriate agricultural technology that enables them to farm in the absence of males (considering their need to conserve time). Some specific recommendations to address the results and needs for female Guinean farmers indicated from this research:

1) **Addressing weeding**: Weeding is a chore that is typically done only by women. It is time-consuming and repetitive. Herbicides would reduce the need to weed, but would also negatively impact soil conditions and comprise additional expenses and health risks. Chris Condello, a Pennsylvania State University Master Gardner, explains the need to understand how to work with, and not against, weeds in his blog *Practical Permaculture: The Art of Weeding*:

   "Permaculture isn't really so much about weed eradication, the weeds are going to grow one way or another. The simple act of composting the weeds you pull instead of throwing them away is a basic permaculture principle, learning which ones to leave in the ground, and for how long is an art. Many weeds are perfectly acceptable when left in the ground, and often play a major role in the overall eco-system of your garden[9]."

   Permaculture practices, as well as knowledge about appropriate complementary plants for intercropping can help to reduce the need to weed and save time for women.

[9] https://chriscondello.wordpress.com/2013/03/01/practical-permaculture-the-art-of-weeds/

2) **Addressing lack of control over resources**: Many respondents noted that women are increasingly involved in training and in women's producers' groups. This provides a platform for building the capacity of women's producers' group activities through creating savings and credit groups. These groups can acquire and rent appropriate technology, and can serve as income repositories for use by other women.

3) **Addressing need for appropriate technology**: These are needed as time and labor-saving devices in absence of male farm workers, and can also help women to process their products to add value. If ISAV/F were to increase their capacity to design and make available labor-saving devices such as the Purdue PUP and its attachments, and to target access of this appropriate technology to women, this would be a boon to agricultural production in areas where women are working the crop fields and home gardens alone.

4) **Addressing the need for extension services:** Portable devices with platforms on agricultural education and climate adaptation training can serve groups of women, who would be able to access the information and share it among themselves. Some examples of these platforms are ESOKO, Google Farmer's Friend, Manobi, and Nokia Life Tools. A USAID briefing paper: *Software Platforms for Mobile Applications for Agriculture Development*[10] discusses such platforms and lists some of the better-known ones. These platforms typically provide extension services such as market information, plant diagnostics, farm-level soil diagnostics, and other information.

10 https://agrilinks.org/sites/default/files/resource/files/Software%20Platforms%20for%20Mobile%20Applications%20for%20Agriculture%20Development.pdf